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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/639,992	08/16/2000	Yasuhiro Tsutamori	Q60457	1827

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EXAMINER

KIM, CHONG R

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/639,992

Applicant(s)

TSUTAMORI ET AL.

Examiner

Charles Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 13-15, 20-23, 28-30, 35-37, 40-44 and 48 is/are rejected.
- 7) ☒ Claim(s) 5-12, 16-19, 24-27, 31-34, 38, 39 and 45-47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on December 16, 2004 has been entered and made of record.
2. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argue (pages 16-17) that their claimed invention (claims 1-4, 20-23) differs from the prior art because "Suzuki does not compare the difference between the pixel value of the pixel of notice and pixel values of proximal pixel value group, to a predetermined level. Instead, Suzuki has two threshold levels..." The Examiner responds by pointing out that the single "predetermined level" recited in claim 1, line 11, reads on the two predetermined levels (threshold levels) taught by Suzuki, since the claim language does not limit the number of predetermined levels to only one predetermined level.

Applicants further argue (page 18) that, "Suzuki does not take into account the density signal levels of pixels adjacent to the subject pixel, but rather only considers two outlier values from among the group of pixels. The Examiner disagrees. Suzuki explains that the "proximal pixel group c" consists of pixels that are adjacent to the pixel of notice (see hatched area in figure 7). Therefore, Suzuki clearly takes into account the density signal levels of pixels adjacent to the subject pixel.

Applicants further argue (page 18) that "the determination of pixel value differences DIFmax and DIFmin being larger than predetermined thresholds THmax and THmin,

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respectively, do not define an abnormal pixel with the characteristic of the difference being greater than a predetermined number, as claimed.” The Examiner disagrees. Suzuki explains that the SELmax or SELmin is considered active if the difference between the pixel of notice and the pixels adjacent to the pixel of notice is greater than a predetermined level (col. 4, lines 44-61). Suzuki also explains that if the SELmax or SELmin is active, then the pixel of notice is modified accordingly (col. 5, lines 13-25). On the other hand, if neither SELmax or SELmin is active, then the pixel of notice is left unchanged (col. 5, lines 13-25). Accordingly, the Examiner interprets the step of modifying the pixel of notice (active SELmax or SELmin state) as being analogous to defining the subject pixel as an abnormal pixel.

Applicants further argue (page 19) that their claimed invention (claims 3 and 4) differs from the prior art because “Applicant’s abnormal pixel determining means compares the difference between density signal level of the subject pixel and the density signal levels of adjacent pixels only when the subject pixel is either higher than the maximum value or lower than the minimum value.” The Examiner responds by pointing out that the claim language does not indicate that the comparison process is performed only when the subject pixel is either higher than the maximum value or lower than the minimum value. For example, claim 3 (lines 6-11) recites, “judge whether or not the difference between the density signal level of the subject pixel and the density signal levels of pixels adjacent to the subject pixel is greater than the predetermined level when the density signal level of the subject pixel is higher than the maximum value of the density signal levels of the pixels adjacent to the subject pixel or when the density signal level of the subject pixel is lower than the minimum value of the density signal levels of the pixels adjacent to the subject pixel.” In this case, Suzuki discloses the step of

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determining whether the density signal level of each subject pixel is higher or lower than a maximum and minimum value respectively, of the pixels adjacent to the subject pixel (figure 4. Note that if DIFmax is determined to be a negative value, then the subject pixel is higher than a maximum value of the pixels adjacent to the subject pixel. Also, if DIFmin is determined to be a positive value, then the subject pixel is lower than a minimum value of the pixels adjacent to the subject pixel). Suzuki also discloses that the comparison/judging step is performed when DIFmax is negative or when DIFmin is positive (see figure 4).

Applicants further argue (page 20) that their claimed invention (claims 13-15) differs from the prior art because “Kilgore also does not teach an abnormal pixel determining means in the image processing apparatus defining the subject pixel as abnormal when the difference between the subject pixel and the density signal levels of pixels adjacent to the subject pixel is greater than a predetermined number.” The Examiner responds by pointing out that the Kilgore reference was not relied upon to teach these features. As explained above, Suzuki clearly discloses these features.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 40, 48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Referring to claims 40 and 48, the Examiner was unable to find support in the applicant's specification that indicates that the subject pixel may be accurately defined as an abnormal pixel irrespective of density signal levels of pixels within the region where the subject pixel is located.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 20-23, 35, 40-42, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Suzuki, U.S. Patent No. 5,327,246 ("Suzuki") and Takayama et al., U.S. Patent No. 6,683,643 ("Takayama").

Referring to claim 1, Suzuki discloses an image processing apparatus comprising an abnormal pixel determining means for specifying each pixel in the digital image data as a subject pixel (pixel of notice) [col. 3, lines 29-40], reading density signal level of the subject pixel together with density signal levels of pixels adjacent to the subject pixel (proximal pixel value group), comparing the density signal level of the subject pixel with the density signal levels of pixels adjacent to the subject pixel and defining the subject pixel as an abnormal pixel (noise)

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when the difference between the density signal level of the subject pixel and the density signal levels of pixels adjacent to the subject is greater than a predetermined value (col. 4, lines 8-61).

Suzuki does not explicitly disclose an image data storing means for storing digital image data obtained by photoelectrically detecting light with a CCD to produce analog image data and digitizing the analog pixel data. However, these features were exceedingly well known in the art. For example, Takayama discloses an image data storing means for storing digital image data obtained by photoelectrically detecting light with a CCD to produce analog image data and digitizing the analog pixel data, and a memory means for two-dimensionally mapping and storing the digital image data stored in the image data storing means (col. 10, line 58-col. 11, line 15 and figure 1).

Suzuki and Takayama are combinable because they are both concerned with determining an abnormal pixel in an image for pixel correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus of Suzuki to include the image data storing means and the memory means of Takayama. The suggestion/motivation for doing so would have been to store the digitized pixel data so that it can be retrieved at a later time for further processing. Therefore, it would have been obvious to combine Suzuki with Takayama to obtain the invention as specified in claim 1.

Referring to claim 2, Suzuki further discloses an abnormal pixel correcting means for correcting the density signal level of each subject pixel in accordance with the density signal levels of the pixels adjacent to the subject pixel when the subject pixel is defined as an abnormal pixel by the abnormal pixel determining means [col. 4, line 35-col. 5, line 12. Note that the subject pixel (pixel of notice) that is determined to be abnormal (noise) is replaced with either

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the maximum (Ymax) or minimum (Ymin) pixel value of the pixels adjacent to the subject pixel].

Referring to claim 3, Suzuki further discloses that the abnormal pixel determining means is constituted so as to determine whether the density signal level of each subject pixel is higher than a maximum value of the density signal levels of the pixels adjacent to the subject pixel and whether or not the density signal level of the subject pixel is lower than a minimum value of the density signal levels of the pixels adjacent to the subject pixel, and judge whether or not the difference between the density signal level of the subject pixel and the density signal levels of pixels adjacent to the subject pixel is greater than the predetermined level when the density signal level of the subject pixel is higher than the maximum value of the density signal levels of the pixels adjacent to the subject pixel or when the density signal level of the subject pixel is lower than the minimum value of the density signal levels of the pixels adjacent to the subject pixel (col. 4, lines 35-61).

Referring to claim 4, see the rejection of at least claim 3 above.

Referring to claim 20, Suzuki further discloses that the pixels adjacent to the subject pixel are the group of pixels obtained by excluding the subject pixel from 3×3 pixels including the subject pixel as a center pixel (col. 3, lines 29-55 and figure 7).

Referring to claims 21-23, see the rejection of at least claim 20 above.

Referring to claim 35, Suzuki further discloses that the abnormal pixel determining means is constituted so as to compare the density signal level of the subject pixel with a density signal level representative of all pixels adjacent to the subject pixel (col. 4, lines 13-43 and figure 7. Note that Ymax and Ymin represent the maximum and minimum values from the pixels of

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the proximal pixel value group c, wherein the proximal pixel group consists of all the pixels adjacent to the subject pixel. Therefore, Ymax and Ymin are considered a density signal level that is representative of all pixels adjacent to the subject pixel).

Referring to claim 40, Suzuki and Takayama do not explicitly disclose that the subject pixel may be accurately defined as an abnormal pixel irrespective of density signal levels of pixels within the region where the subject pixel is located. However, Official notice is taken that the step of defining a subject pixel as an abnormal pixel irrespective of density signal levels of pixels within the region where the subject pixel is located was exceedingly well known in the art. Therefore, it would have been obvious to modify the method of Suzuki and Takayama so that the subject pixel is defined as an abnormal pixel irrespective of density signal levels of pixels within the region where the subject pixel is located. The suggestion/motivation for doing so would have been to enhance the flexibility of the abnormal pixel detection step.

Referring to claim 41, see the rejection of at least claim 1 above.

Referring to claim 42, see the rejection of at least claim 35 above.

Referring to claim 48, see the rejection of at least claim 40 above.

5. Claims 13-15, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Suzuki, U.S. Patent No. 5,327,246 ("Suzuki") and Takayama et al., U.S. Patent No. 6,683,643 ("Takayama"), further in view of Kilgore, U.S. Patent No. 5,903,659 ("Kilgore").

Referring to claim 13, Suzuki does not explicitly disclose that the abnormal pixel correcting means is constituted so as to correct the density signal level of each subject pixel in such a manner that the corrected density signal level is equal to an average value of the density

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signal levels of the pixels adjacent to the subject pixel excluding the pixels whose density levels have the maximum value and the minimum value.

Takayama discloses an abnormal pixel correcting means that is constituted so as to correct the density signal level of each subject pixel in such a manner that the corrected density signal level is equal to an average value of the density signal levels of the pixels adjacent to the subject pixel (col. 6, lines 10-15).

Suzuki and Takayama are combinable because they are both concerned with determining an abnormal pixel in an image for pixel correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the abnormal pixel correcting means of Suzuki so that it corrects the density signal level of each subject pixel in such a manner that the corrected density signal level is equal to an average value of the density signal levels of the pixels adjacent to the subject pixel, as taught by Takayama. The suggestion/motivation for doing so would have been to provide the capability to cope with aging changes of defective pixels in the image and detect the abnormal pixels accurately (Takayama, col. 2, lines 24-32).

Suzuki and Takayama do not explicitly disclose that the average value of the density signal levels of the pixels adjacent to the subject pixel excludes the pixels whose density levels have the maximum value and the minimum value. However, this feature was exceedingly well known in the art. For example, Kilgore discloses the step of determining an average value of the density levels of pixels that excludes the pixels whose density levels have the maximum value and the minimum value (col. 5, lines 32-59).

Suzuki, Takayama, and Kilgore are combinable because they are all concerned with correcting noise in image data. At the time of the invention, it would have been obvious to a

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person of ordinary skill in the art to modify the average value of the density signal levels of Suzuki and Takayama so that they exclude the pixels whose density levels have the maximum value and the minimum value as taught by Kilgore. The suggestion/motivation for doing so would have been to eliminate the bias affect on the average value caused by the minimum and maximum pixel values (Kilgore, col. 5, lines 57-59). Therefore, it would have been obvious to combine Suzuki and Takayama with Kilgore to obtain the invention as specified in claim 13.

Referring to claims 14 and 15, see the rejection of at least claim 13 above.

Referring to claims 28-30, see the rejection of at least claim 20 above.

6. Claims 36, 37, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Suzuki, U.S. Patent No. 5,327,246 ("Suzuki"), Takayama et al., U.S. Patent No. 6,683,643 ("Takayama"), and Casper, U.S. Patent No. 4,672,437 ("Casper").

Referring to claim 36, Suzuki and Takayama do not explicitly disclose that abnormal pixel determining means is constituted so as to compare the density signal level of the subject pixel with an average of density signal levels of pixels adjacent to the subject pixel. However, this feature was exceedingly well known in the art. For example, Casper discloses the step of comparing the density signal level of a subject pixel with an average of density signal levels of pixels adjacent to the subject pixel (col. 3, lines 48-68).

Suzuki, Takayama, and Casper are combinable because they are all concerned with correcting noise in image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the abnormal pixel determining means of Suzuki and Takayama in view of Casper. The suggestion/motivation for doing so would have been to

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enhance the flexibility of the noise cleaning process. Therefore, it would have been obvious to combine Suzuki and Takayama with Casper to obtain the invention as specified in claim 36.

Referring to claim 37, Casper further discloses the step of comparing the density signal level of the subject pixel with a threshold, wherein the threshold is a deviation from an average of density signal levels of pixels adjacent to the subject pixel (col. 3, lines 48-68).

Referring to claim 43, see the rejection of at least claim 36 above.

Referring to claim 44, see the rejection of at least claim 37 above.

Allowable Subject Matter

7. Claims 5-12, 16-19, 24-27, 31-34, 38, 39, 45-47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 571-272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


ck

April 25, 2005


Jon Chang
Primary Examiner